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MARK D. SARALINO (GENERAL)
RENNER, OTTO, BOISSELLE & SKLAR, LLP
1621 EUCLID AVENUE, NINETEENTH FLOOR
CLEVELAND, OH 44115-2191

EXAMINER	
BODDIE, WILLIAM	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/789,231	BROWN, CHRISTOPHER JAMES	
	Examiner	Art Unit	
	William L. Boddie	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated September 4th, 2007, the Applicant amended claims 2, 22, 25 and 34. Currently claims 1-36 are pending.

Response to Arguments

On pages 9-10 of the Remarks, the Applicant argues that Tanaka does not disclose the generation of a sensor signal by and within a display picture element. The Applicant alleges that instead, Tanaka discloses generation of a sensor signal by and within a photodetecting section.

The Examiner respectfully disagrees. It is important to first note the Applicant's own definition of "display picture element." At the bottom of page 1 of the Applicant's specification the word pixel is shown to be a substitute for picture element. With this definition in mind we turn to the disclosure of Tanaka.

Tanaka, discloses in column 1, lines 42 to 46, that a photoconductive film formed on a gate line is still considered "in a pixel." Tanaka also discloses in column 3, lines 52 to 54, "the photodetecting section 42 **of** only one pixel" (emphasis added). From these two disclosures and the labeling of the figures Tanaka is seen as sufficiently disclosing that the photodetecting section is considered a part of a display picture element.

For the reasons shown above, the Tanaka is seen as sufficiently disclosing the broadest reasonable interpretation of claim 1. As such the rejection of claim 1 is maintained.

Additional Applicant's arguments on pages 11-13, have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5-10, 13 and 31-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al. (US 5,151,688).

With respect to claim 1, Tanaka discloses, an active matrix display (col. 1, line 10) and sensor apparatus (2 in fig. 3; in part), comprising: an array of display picture elements (5-7, 41 and 110 in fig. 6) arranged as rows and columns (clear from fig. 6), each picture element having a display data input (6 in fig. 6) for receiving image data to be displayed and a scan input (5 in fig. 6) for enabling input of image data from the data input,

said data inputs of said picture elements of each column being connected to a respective column data line (3 in fig. 6) and said scan inputs of said picture elements of each row being connected to a respective row scan line (1 in fig. 6);

a data signal generator (200 in fig. 6) for supplying data signals to the column data lines;

a scan signal generator (81 in fig. 6) for supplying scan signals to said row scan lines; and

an output arrangement (44-49 in fig. 6) connected to said column data lines for outputting sensor signals generated by and within said display picture elements in response to external stimuli (col. 5, lines 36-47, for example).

With respect to claim 5, Tanaka discloses, an apparatus as claimed in claim 1 (see above), in which each of said picture elements comprises an image generating element (110 in fig. 6) and an electronic switch (41 in fig. 6).

With respect to claim 6, Tanaka discloses, an apparatus as claimed in claim 5 (see above), in which each of said image generating elements comprises a liquid crystal element (col. 5, line 15).

With respect to claim 7, Tanaka discloses, an apparatus as claimed in claim 5 (see above), in which each of said picture elements comprises a storage capacitor (Cs in fig. 6).

With respect to claim 8, Tanaka discloses, an apparatus as claimed in claim 5 (see above), in which each of said electronic switches comprises a thin film transistor (col. 1, line 33).

With respect to claim 9, Tanaka discloses, an apparatus as claimed in claim 8 (see above), in which each of said transistors has a gate connected to said picture element scan input (5 in fig. 6), a source connected to said picture element data input (6 in fig. 6), and a drain connected to said image generating element (7 in fig. 6; col. 3, lines 46-47).

With respect to claim 10, Tanaka discloses, an apparatus as claimed in claim 1 (see above), comprising a controller (clock in fig. 6) for controlling at least one of said data and scan signal generators and said output arrangement (col. 5, lines 18-20, for example).

With respect to claim 13, Tanaka discloses, an apparatus as claimed in claim 10 (see above), in which said controller is arranged to control which of said picture element sensor signals are output by said output arrangement (see clock input into 46 in fig. 6; also note col. 6, lines 13-24).

With respect to claim 31, Tanaka discloses, an apparatus as claimed in claim 1 (see above), in which said output arrangement is responsive to a characteristic of said picture elements comprising at least one of voltage, current, stored charge and capacitance (leaked voltage signal; col. 5, lines 54-66).

With respect to claim 32, Tanaka discloses, an apparatus as claimed in claim 1 (see above), in which said output arrangement comprises a plurality of sense amplifiers (44 in fig. 6) connected to said column data lines (col. 5, line 60).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. ("Entry of Data and Command for an LCD by Direct Touch: An Integrated LCD Panel"; **hereinafter Tanaka-SID**) in view of Tanaka et al. (US 5,151,688).

With respect to claim 1, Tanaka-SID discloses, an passive matrix display (col. 1, line 10) and sensor apparatus (HPF, A/d, etc. in fig. 4), comprising: an array of display picture elements (darkened spots in fig. 4) arranged as rows and columns (clear from fig. 4), each picture element having a display data input (section of column electrode) for receiving image data to be displayed and a scan input (section of row electrode) for enabling input of image data from the data input,

said data inputs of said picture elements of each column being connected to a respective column data line (3 in fig. 6) and said scan inputs of said picture elements of each row being connected to a respective row scan line (1 in fig. 6);

a data signal generator (LCD Driver in fig. 4) for supplying data signals to the column data lines;

a scan signal generator (LCD driver in fig. 4) for supplying scan signals to said row scan lines; and

an output arrangement (HPF, micro computer etc. in fig. 4) connected to said column data lines for outputting sensor signals generated by and within said display picture elements in response to external stimuli (page 1; "operational principle of the TED").

Tanaka-SID does not expressly disclose an active matrix display or any of the usual circuitry associated with such a display type.

Tanaka discloses, an active matrix display (col. 1, line 10) and sensor apparatus (2 in fig. 3; in part), comprising: an array of display picture elements (5-7, 41 and 110 in fig. 6) arranged as rows and columns (clear from fig. 6), each picture element having a display data input (6 in fig. 6) for receiving image data to be displayed and a scan input (5 in fig. 6) for enabling input of image data from the data input,

said data inputs of said picture elements of each column being connected to a respective column data line (3 in fig. 6) and said scan inputs of said picture elements of each row being connected to a respective row scan line (1 in fig. 6);

a data signal generator (200 in fig. 6) for supplying data signals to the column data lines;

a scan signal generator (81 in fig. 6) for supplying scan signals to said row scan lines.

Tanaka-SID and Tanaka are analogous art because they are both from the same field of endeavor namely input/output displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the active matrix circuitry of Tanaka in the display of Tanaka-SID.

The motivation for doing so would have been, the well-known advantage of better display quality and higher contrast ratios.

With respect to claim 2, Tanaka and Tanaka-SID disclose, an apparatus as claimed in claim 1 (see above).

Tanaka-SID further discloses, a method for entry of data and command in an LCD by direct touch, wherein sensor signals are generated by and within an optically

variable region of each display picture element of the LCD (col. 2, 3rd para. for example; also note figs. 2 and 4).

6. Claims 3-4 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Zhang et al. (US 6,087,648).

With respect to claim 3, Tanaka discloses, an apparatus as claimed in claim 1 (see above).

Tanaka does not expressly disclose, comprising a display substrate on which are integrated said data signal generator, said scan signal generator, said output arrangement, and electronic components of the array.

Zhang discloses, an active matrix display device comprising a display substrate (10 in fig. 1) on which are integrated a data signal generator (22 in fig. 1), a scan signal generator (22 in fig. 1), an output arrangement (32 in fig. 1), and electronic components of the array (21 in fig. 1; also note col. 1, lines 12-18).

Zhang and Tanaka are analogous art because they are both from the same field of endeavor namely input/output displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to integrate all of the display driving components onto the substrate of Tanaka as taught by Zhang.

The motivation for doing so would have been to reduce cost, size and weight of a liquid crystal panel (Zhang; col. 1, lines 19-22).

With respect to claim 4, Zhang and Tanaka disclose, an apparatus as claimed in claim 3 (see above).

Tanaka further discloses, wherein said data signal generator is disposed along a first edge of said array and said output arrangement is disposed along a second edge of said array opposite said first edge (clear from fig. 6).

With respect to claim 11, Zhang and Tanaka disclose, an apparatus as claimed in claim 3 (see above).

Tanaka further discloses, as modified by Zhang, comprising a controller (clock in fig. 6) for controlling at least one of said data and scan signal generators and said output arrangement (Tanaka; col. 5, lines 18-20), in which said controller is integrated on said display substrate (Zhang; 40 in fig. 1).

With respect to claim 12, Zhang and Tanaka disclose, an apparatus as claimed in claim 11 (see above).

Tanaka further discloses, comprising active devices embodied as thin film transistors (41 in fig. 6; col. 1, line 33).

7. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Ure (US 5,982,302).

With respect to claim 14, Tanaka discloses, an apparatus as claimed in claim 13 (see above).

Tanaka does not expressly disclose, wherein said controller is programmable to determine which of said picture element sensor signals are output by said output arrangement.

Ure discloses, a touch screen, wherein a controller (75 in fig. 6) is programmable (figs. 7-10; col. 5, lines 45-49) to determine which of picture element sensor signals (fig. 3 for example) are output by an output arrangement (71 in fig. 6).

Ure and Tanaka are analogous art because they are both from the same field of endeavor namely touch screen display control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the controller of Tanaka with the programmable controller of Ure.

The motivation for doing so would have been offer high pointing resolution in a small-defined space (Ure; col. 1, lines 24-27).

With respect to claim 15, Tanaka and Ure disclose, an apparatus as claimed in claim 14 (see above).

Ure further discloses, wherein said controller is reprogrammable during operation of the apparatus to change which of said picture element sensor signals are output by said output arrangement (clear from figs. 7-10; also note col. 7, lines 12-29).

8. Claims 16-17 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Inoue et al. (US 5,929,834).

With respect to claim 16, Tanaka discloses, an apparatus as claimed in claim 10 (see above).

Tanaka does not expressly disclose, wherein said controller is arranged to control operation of said data and scan signal generators and said output arrangement to define alternating image writing phases and sensor reading phases.

Inoue discloses, a liquid crystal touch screen (fig. 4) wherein a controller (11, 12 in fig. 4) is arranged to control operation of a data and scan signal generator (9 and 10 in fig. 4) and an output arrangement (15-17 in fig. 4) to define alternating image writing phases and sensor reading phases (note fig. 5; col. 2, lines 8-11col. 6, lines 1-6).

Inoue and Tanaka are analogous art because they are both from the same field of endeavor namely touch screen display control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the controller of Inoue with the alternating writing and sensing controller of Inoue.

The motivation for doing so would have been to detect the coordinate position without affecting the display operation (Inoue; col. 2, lines 41-43).

With respect to claim 17, Inoue and Tanaka disclose, an apparatus as claimed in claim 16 (see above).

Inoue further discloses, wherein a frame of image data is written to said array during each of said writing phase (clear from fig. 5).

With respect to claim 19, Inoue and Tanaka disclose, an apparatus as claimed in claim 16 (see above).

Inoue further discloses, wherein at least one row of image data is written to said array during each said writing phase (clear from fig. 5; col. 4, lines 56-62).

With respect to claim 20, Inoue and Tanaka disclose, an apparatus as claimed in claim 19 (see above).

Tanaka, as modified by Inoue, further discloses, in which each said reading phase comprises outputting said sensor signals from at least one row of picture elements after said at least one row to which image data were written during a preceding writing phase (note fig. 5 of Inoue which discloses detecting signals along rows which were previously write addressed in the frame).

With respect to claim 21, Inoue and Tanaka disclose, an apparatus as claimed in claim 16 (see above).

Inoue further discloses, wherein sensor signals of all of said picture elements are output during each said reading phase (col. 5, lines 37-63).

9. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Yoneda et al. (US 5,677,744).

With respect to claim 16, Tanaka discloses, an apparatus as claimed in claim 10 (see above).

Tanaka does not expressly disclose, wherein said controller is arranged to control operation of said data and scan signal generators and said output arrangement to define alternating image writing phases and sensor reading phases.

Yoneda discloses, a liquid crystal touch screen (title) wherein output of data and scan signals (9 and 10 in fig. 4) and an output arrangement (coordinate detection circuit; col. 2, lines 13-14) define alternating image writing phases (tA in fig. 7) and sensor reading phases (tB in fig. 7; clear from fig. 7 that they are alternating; also note col. 11, lines 34-39).

Yoneda and Tanaka are analogous art because they are both from the same field of endeavor namely touch screen display control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the controller of ~~Inoue~~ Tanaka with the alternating writing and sensing circuitry of Yoneda.

The motivation for doing so would have been to not disturb any display operation (Yoneda; col. 11, lines 28-35).

With respect to claim 18, Yoneda and Tanaka disclose, an apparatus as claimed in claim 16 (see above).

Yoneda further discloses, in which each said reading phase occurs during a vertical blanking period between consecutive said writing phases (col. 11, lines 40-47).

10. Claims 22-23, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Yoneda et al. (US 5,677,744) and further in view of Ure (US 5,982,302).

With respect to claims 22 and 23, Tanaka and disclose, an apparatus as claimed in claim 16 (see above).

Neither Tanaka nor Yoneda expressly disclose, in which the sensor signals of a proper subset of all of said picture elements are output during each said reading phase.

Ure discloses, a touch screen, wherein sensor signals of a proper subset of all of a set of picture elements are output during each said reading phase (col. 5, lines 45-49; also note figs. 7-10).

Ure, Tanaka and Yoneda are all analogous art because they are all from the same field of endeavor namely, touch screen display control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to output a subset of sensor signals from the picture elements of Tanaka and Yoneda as taught by Ure.

The motivation for doing so would have been to achieve a simple yet powerful method of user interaction in which the traditional keyboard and mouse disappear (Ure; col. 1, line 55).

With respect to claim 25, Tanaka, Yoneda and Ure disclose, an apparatus as claimed in claim 25 (see above).

Ure further discloses, wherein said at least one group comprises a plurality of groups which are substantially evenly spaced in the column direction of said array (fig. 3; each row is seen as a group; as such the plurality of rows are evenly spaced as they are adjacent to one another).

With respect to claim 27, Tanaka, Yoneda and Ure disclose, an apparatus as claimed in claim 25 (see above).

Ure further discloses, wherein said at least one group comprises a plurality of adjacent rows (clear from fig. 3).

11. Claims 22 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Yoneda et al. (US 5,677,744) and further in view of Yamamoto et al. (US 5,691,513).

With respect to claim 22, Tanaka and Yoneda disclose, an apparatus as claimed in claim 16 (see above).

Neither Tanaka nor Yoneda expressly disclose, in which the sensor signals of a proper subset of all of said picture elements are output during each said reading phase.

Yamamoto discloses, a touch screen, wherein sensor signals of a proper subset of all of a set of picture elements are output during each said reading phase (fig. 3; 11-19 are scanned first then followed by 21-29 in the subsequent reading phase; col. 7, lines 51-65).

Tanaka, Yoneda and Yamamoto are all analogous art because they are all from the same field of endeavor namely, touch screen display control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to select output a subset of sensor signals from the picture elements of Tanaka and Yoneda as taught by Yamamoto.

The motivation for doing so would have been the higher speed and correct operation in a coordinate data detecting process (Yamamoto; col. 3, lines 53-61).

With respect to claim 24, Tanaka, Yamamoto and Yoneda disclose, an apparatus as claimed in claim 22 (see above).

Yamamoto further discloses, a touch screen scanning method in which said proper subset of picture elements comprises different picture elements during each reading phase of a group of reading phases such that said sensor signals of all of said picture elements are output during each group of said reading phases (col. 7, lines 50-

65; discloses scanning half of the elements and then should the user's input not be detected then the other remaining elements are scanned. Also note figs. 3 and 4).

With respect to claim 25, Tanaka, Yoneda and Yamamoto disclose, an apparatus as claimed in claim 22 (see above).

Yamamoto further discloses, wherein said proper subset of picture elements comprises at least one group of rows of picture elements, the or each group containing at least one row (clear from figs. 3 and 4 that the subset includes at least one group of several rows).

With respect to claim 26, Tanaka, Yoneda and Yamamoto disclose, an apparatus as claimed in claim 25 (see above).

Yamamoto further discloses, wherein said at least one group comprises a plurality of groups which are substantially evenly spaced in the column direction of said array (clear figs. 3 and 4 that the first scanning rows are evenly spaced apart).

12. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Machida et al. (US 5,835,076).

With respect to claim 28, Tanaka discloses, an apparatus as claimed in claim 13 (see above).

Tanaka does not expressly disclose, wherein said controller is arranged to control operation of said data and scan signal generators and said output arrangement to write image data to and to read sensor signals from said array simultaneously.

Machida discloses, wherein a controller (11 in fig. 4) is arranged to control operation of said data (7 in fig. 4) and scan (9 in fig. 4) signal generators and said

output arrangement (7 and 8 in fig. 4) to write image data to and to read sensor signals from said array simultaneously (col. 2, lines 1-24 for example).

Tanaka and Machida are all analogous art because they are all from the same field of endeavor namely, touch screen display control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the controller of Tanaka with the simultaneous writing and reading circuitry of Machida.

The motivation for doing so would have been to increase the contrast of the display device (Machida; col. 1, lines 49-53).

With respect to claim 29, Tanaka and Machida disclose, an apparatus as claimed in claim 28 (see above).

Machida further discloses, wherein said data signal generator is arranged to supply image data to first ones of said data lines and said output arrangement is arranged to read sensor signals simultaneously from second one of said data lines different from said first ones for each row of said picture elements (col. 2, lines 1-24).

With respect to claim 30, Tanaka and Machida disclose, an apparatus as claimed in claim 29 (see above).

Machida further discloses, wherein said first and second ones are the same for all of the rows of said picture elements (see fig. 6 and note col. 3, lines 34-51).

13. Claims 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 5,151,688) in view of Nakashima (US 5,729,251).

With respect to claim 33, Tanaka discloses, an apparatus as claimed in claim 32 (see above).

Tanaka does not expressly disclose, wherein the number of sense amplifiers is less than the number of data lines and each sense amplifier is connectable to any one of a respective set of said data lines by a respective first multiplexer.

Nakashima discloses, a touch screen display system (fig. 15) wherein a number of sense amplifiers (104b in fig. 15) is less than the number of data lines (LX1-2 in fig. 15) and each sense amplifier is connectable to any one of a respective set of said data lines by a respective first multiplexer (103b in fig. 15).

Tanaka and Nakashima are analogous art because they are both from the same field of endeavor namely scanning and detection circuitry for touch screen display devices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the one-to-one amplifiers and analog switch with the multiplexer and amplifier ratio taught by Nakashima.

The motivation for doing so would have been decreased cost and lessened manufacturing time due to the reduction in detector/amplifiers required.

With respect to claim 34, Tanaka and Nakashima disclose, an apparatus as claimed in claim 32 (see above).

Tanaka does not expressly disclose, a plurality of analog/digital converters.

Nakashima further discloses, wherein a output arrangement (103-110 in fig. 15) comprises a plurality of analog/digital converters (109 and 107-109 in fig. 15) connected

to outputs of said sense amplifiers (note fig. 16 which discloses the digital output of the decoder when supplied with an input analog signal).

It would have been obvious to include the plurality of analog/digital converters as taught by Nakashima in the touch screen device of Tanaka.

The motivation for doing so would have been to allow the position information to be digitally stored and further coded (Nakashima; col. 15, lines 13-15).

With respect to claim 35, Tanaka and Nakashima disclose, an apparatus as claimed in claim 34 (see above).

Nakashima further discloses, wherein the number of said converters (2 in fig. 15) is less than the number of said sense amplifiers (9 in fig. 15) and each said sense amplifier is connectable to any one of a respective set of said sense amplifier outputs (clear from fig. 15) by a respective second multiplexer (106 in fig. 15).

With respect to claim 36, Tanaka and Nakashima disclose, an apparatus as claimed in claim 34 (see above).

Tanaka further discloses, in which said output arrangement comprises a shift register (46 in fig. 6) for converting parallel outputs from said converters to a serial output.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb
10/19/07

SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER